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1.0 Overview

1.1 Acknowledgement

Dear customer, thank you for choosing our products. In order to fully develop the performance of the pellet mill, enhance productivity, ensure production safety and prolong the service life, please read this manual carefully in advance to ensure proper operation and maintenance. Please strictly follow the operation regulations & instructions.

1.2 Application

The mill is designed to manufacture animal feed pellets and high-density biomass pellets with raw materials of sawdust, straw, rice husk and tree bark, etc. Biomass pellet is a kind of high efficient clean renewable energy with the advantages of saving energy and reducing carbon emissions. It is widely used in house-warming and power generation. It is an alternative fuel for non-renewable energy resources of coal, oil, gas, etc. Biomass pellets are also easily stored and transported.

1.3 Categories

Our pellet mills have different models, which are classified by below matters:

1.3.1 Raw materials: Animal feed material and biomass material;

1.3.2 Structures: die-driving types and roller-driving types;

1.3.3 Power forces: electrical motor, diesel engine, gasoline engine and PTO.

1.4 Safety warnings

All mills are not lubricated before leaving factory. Please lubricate the mill before any operation according to this manual and the label on the mill.
Mix the raw material, abrasive material, and waste engine oil, and add the mixture to grind the pelletizing holes before the first time to make pellet.
Do not touch the rotating parts during running.
Mix the raw material and waste engine oil, and add the oily mixture after pelletizing, let the oily mixture run through the mill 3 times, and then shut down the mill. Please note: This process is to avoid the material blocking in the pelletizing holes.
Cut off the power source or turn off the engine before maintenance or internal inspection.

2.0 Introduction

2.1 Main specification and technical parameters

The output capacity depends on raw material you use, and the following data are based on pine saw dust pellet production. The animal feed pellets production capacity is double than that of biomass pellets. Electric motor can be customized according to customer's requirements, including voltage and hertz. Please note that our mills operate in industrial power **380V/50Hz (China Standard), three phases.**

Biomass roller-driving (ZLSP-R)				
Model	**Power**	**Sawdust Capacity (kg/lbs）/h**	**Weight （kg/lbs）**	**Packing Size （mm/inch）**
ZLSP200A	15Hp	80-120	320/350	1460*950*1100
		170-270	705/772	58*37*55
ZLSP300A	36Hp	250-350	850/890	1100*700*2480
		550-770	1874/1962	43*28*98
ZLSP400A	55Hp	350-450	1010/1050	1300*800*2600
		770-990	2227/2315	51*31*102
ZLSP200B	7.5KW	80-120	215/245	950*450*1050
		170-270	475/540	37*18*41
ZLSP300B	22KW	250-350	540/575	1350*750*1400
		550-770	1190/1268	53*30*55
ZLSP400B	30KW	350-450	770/810	1400*800*1450
		770-990	1698/1785	55*31*57
ZLSP200P	≥15Hp	80-120	150/170	1000*540*1050
		170-270	330/375	39*21*41
ZLSP300P	≥36Hp	250-350	375/400	1200*640*1400
		550-770	826/881	47*25*55
ZLSP400P	≥55Hp	350-450	560/585	1400*700*1450
		770-990	1235/1289	55*27*57

Die-driving (ZLSP-D)					
Model	**Power**	**Capacity(kg/lbs)/hr**		**Weight**	**Packing Size**
		Sawdust	**Feed**	**（kg/lbs）**	**（mm/inch）**
ZLSP120A	8Hp	--	60-100	120/140	900x500x730
		90-180	132-220	265/310	35*20*29
ZLSP150A	8Hp	50-100	90-120	180/220	1000*500*750
		110-220	200-265	400/490	39*20*30
ZLSP200A	15Hp	80-120	200-300	210/240	1460*750*900
		180-265	440-660	460/530	58*30*35
ZLSP230A	22Hp	120-200	300-400	280/310	1560*850*1000
		245-440	660-880	620/680	61*33*39
ZLSP260A	35Hp	160-250	400-600	330/360	1200*500*1070
		350-550	880-1300	730/790	47*22*41
ZLSP300A	55Hp	250-400	600-800	410/450	1220*600*1000
		550-880	1300-1760	900/990	48*23*39
ZLSP120Q	7.5Hp	--	60-100	120/140	900x500x730
		90-180	132-220	265/310	35*20*29
ZLSP150Q	10Hp	50-100	90-120	180/220	1000*500*750
		110-220	200-265	400/490	39*20*30
ZLSP120B	2.2KW/ 3KW	--	60-100	80/100	750*320*680
		90-180	132-220	175/220	30*13*27
ZLSP150B	4KW/ 5.5KW	50-90	90-120	95/110	800*450*700
		110-200	200-265	210/250	31*18*28
ZLSP200B	7.5KW	80-120	200-300	200/230	1050*480*930
		180-265	440-660	440/510	41*19*37
ZLSP230B	11KW	120-200	300-400	290/320	1180*540*1000
		245-440	660-880	640/105	46*21*39
ZLSP260B	15KW	160-250	400-600	320/360	1240*540*950
		350-550	880-1300	705/800	49*21*37

ZLSP300B	22KW	250-400	600-800	350/380	1300*560*1100
		550-880	1300-1760	770/840	51*20*43
ZLSP150C	5.5KW	60-110	90-120	105/125	1000*480*780
		130-240	200-265	230/280	39*19*31
ZLSP200C	7.5KW	80-120	200-300	210/230	1050*550*830
		180-265	440-660	460/510	42*22*33
ZLSP230C	11KW	120-200	300-400	290/320	1200*560*950
		245-440	660-880	640/705	47*22*37
ZLSP260C	15KW	160-250	400-600	340/370	1240*580*1000
		350-550	880-1300	750/815	49*23*39
ZLSP300C	22KW	250-400	600-800	425/465	1300*620*1100
		550-880	1300-1760	940/1025	51*24*43
ZLSP120P	≥8Hp	--	60-100	80/100	900*540*900
		90-180	132-220	175/220	35*21*35
ZLSP150P	≥8Hp	50-100	90-120	90/110	900*540*1020
		110-220	200-255	200/245	35*21*40
ZLSP200P	≥15Hp	80-120	200-300	130/150	1000*540*1020
		180-265	440-660	290/330	39*21*40
ZLSP230P	≥22Hp	120-200	300-400	175/200	1000*540*1020
		245-440	660-880	385/440	39*21*40
ZLSP260P	≥30Hp	160-250	400-600	235/260	1050*540*900
		350-550	880-1300	518/580	41*21*35
ZLSP300P	≥55Hp	250-400	600-800	305/330	1100*540*1000
		550-880	1300-1760	680/730	43*21*39

Signification of the model name:

ZL: Pellet Mill **S: Animal Feed** **M: Wood Biomass** **P: Flat Die**

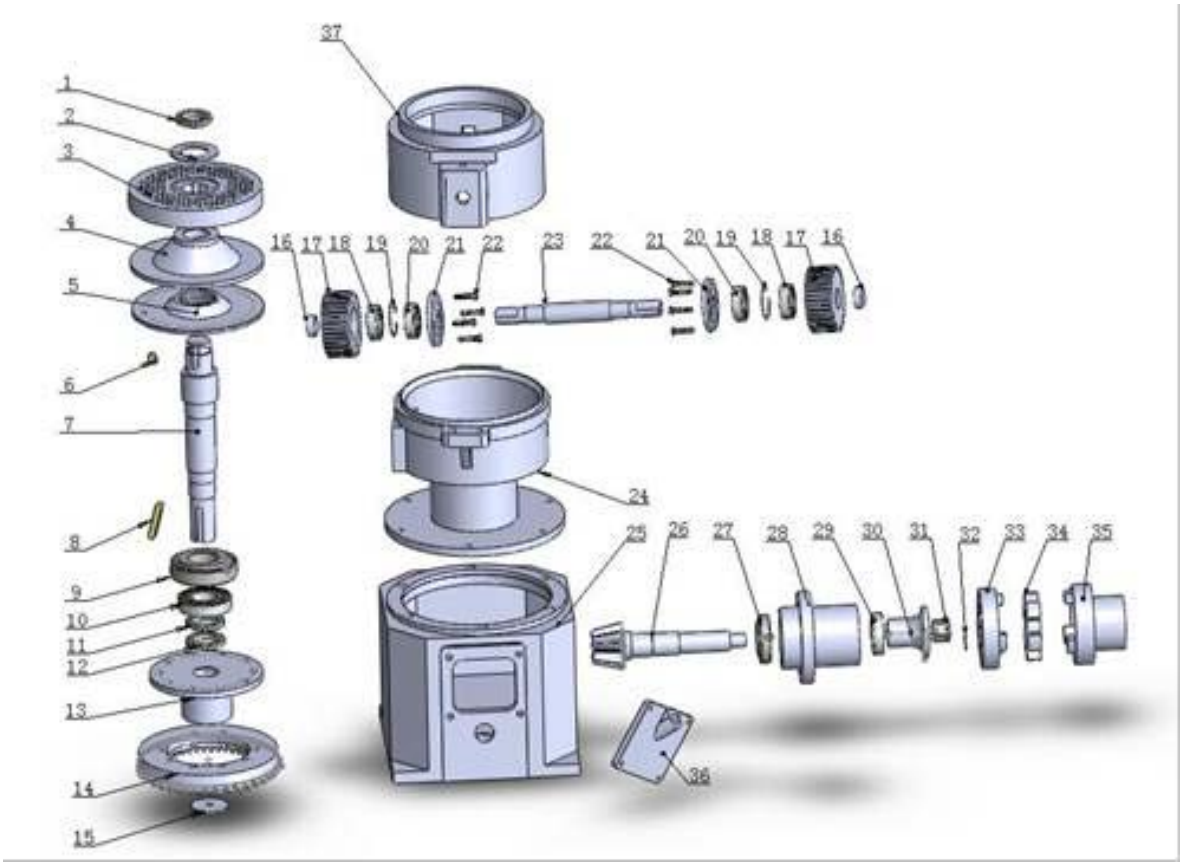
D: Die-driving **R: Roller-driving**

A: Diesel Engine **B: Motor** **C: Covered Motor**

Q: Gasoline Engine **P: PTO**

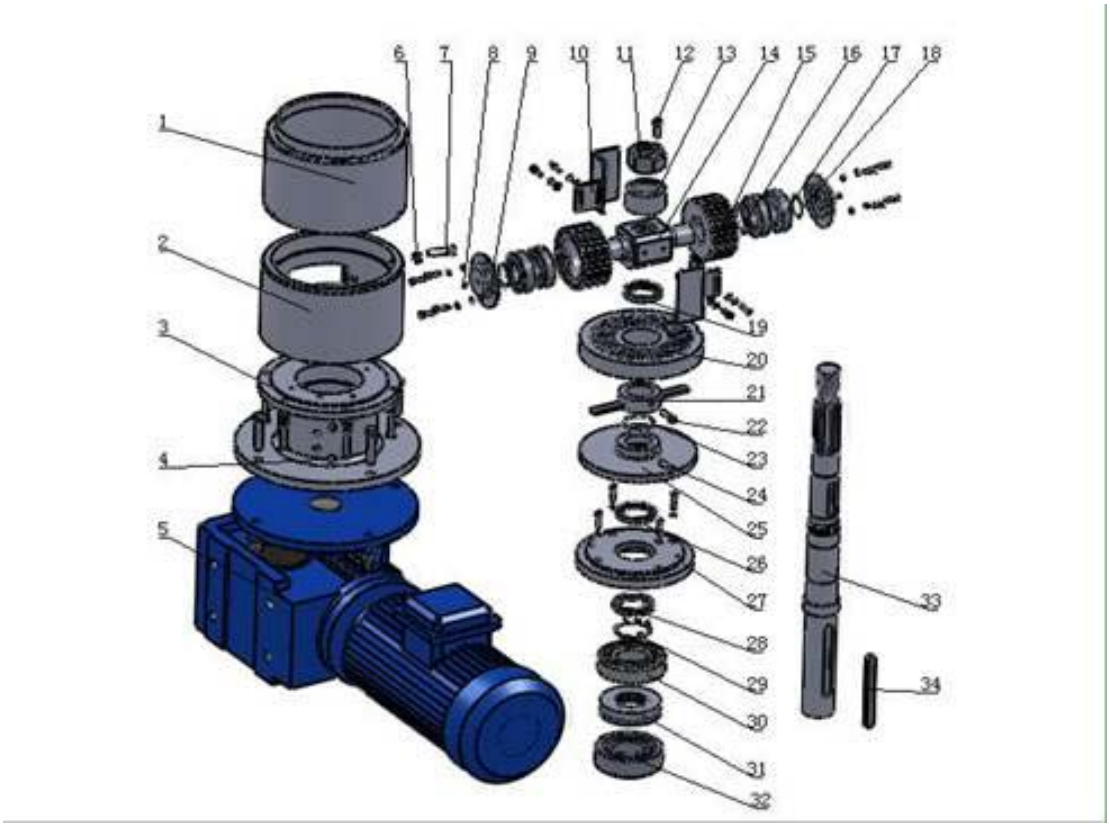
2.2 Structure and main parts

2.2.1 Structure and main parts of model ZLSP-D



Item	Description	Qty	Item	Description	Qty
1	Round Nut	1	20	Bearing	2
2	Flat Washer	1	21	Bearing Cover of Roller	2
3	Die	1	22	Hex Bolt	8
4	Disc of Throwing pellet	1	23	Roller Shaft	1
5	Dust Cover of Main Shaft	1	24	Shaft Box	1
6	Flat Key of Type A	1	25	Gear Box	1
7	Main Shaft	1	26	Gear Shaft	1
8	Flat Key	1	27	Bearing	1
9,10	Bearing	1	28	Pinion Seat	1
11	Round Nut	1	29	Bearing	1
12	Round Nut	1	30	Splined Sleeve	1
13	Big Gear Seat	1	31	Castle Nut	1
14	Big Gear	1	32	Cotter Pin	1
15	Washer	1	33	Passive Coupling	1
16	Check Ring	2	34	Elastic Cushion	1
17	Roller	2	35	Active Coupling	1
18	Bearing	2	36	Cover of Observation Hole	1
19	Washer	2	37	Upper Box Body	1

2.2.2 Structure and main parts of model ZLSP-R



Item	Description	Qty	Item	Description	Qty
1	Upper Box Body	1	18	Check Ring	2
2	Shaft Box	1	19	Grease Seal	1
3	Bearing Seat	1	20	Die	1
4	Forced Filling Oil Cup	2	21	Cutter	1
5	Reducer	1	22	Hex Bolt	1
6	Hex Nut	1	23	O Shape Seal Ring	1
7	Hex Bolt	1	24	Disc of throwing pellet	1
8	Plus Fit Force Filling Oil Cup	2	25	Hex Bolt	1
9	Cover of Roller	2	26	Grease Seal	1
10	Feeding Scraper	2	27	Dust Cover of Shaft	1
11	Hex Bolt	1	28	Round Nut	1
12	Nut	1	29	Lock Ring	1
13	Check Ring for Hole	1	30	Bearing	1
14	Roller Shaft	1	31	Grease Seal	1
15	Roller	2	32	Bearing	1
16	Felt	2	33	Main Shaft	1
17	Cylindrical Roller Bearing	4	34	Flat Key	8

2.3 Maintenance

2.3.1 Lubrication

Make sure lubricating oil is added to gearbox and all bearings are properly lubricated before the initial operation.

Check and make sure each rotating part is well lubricated.

Lubricate the mill according to the following chart.

No	Lubrication Part	Oil Type	Lubrication Period	Oil Change Period
1	Roller	Lithium Base Grease	Once per 8 working hours	
2	Main Shaft	Lithium Base Grease	Once per 8 working hours	
3	Gear Box	Hypoid Gear Oil	The initial added lubricating oil should reach the designated position.(measure with dipstick)	Six months for first time; One year later

Diesel engine: Please read and follow *Diesel Engine Manual Instruction.*

Gasoline engine: Please read and follow *Gasoline Engine Manual Instruction.*

PTO: Lubricate bearings and splines with lithium base grease.

2.3.2 Inspection & maintenance of the die and rollers

Inspection of rollers:

The roller should be visually inspected prior to each start-up. Make sure there are no foreign materials affecting roller running. Service life of the die is 300-500 hours under normal running condition. It is recommended to replace roller and die at the same time.

Inspection of die:

The die should be visually inspected prior to start-up. Make sure there are no foreign materials clogging the bearings and each part is tightened. Service life of roller is 300-500 hours under normal running condition. Most of dies can be used on both sides.

3.0 Getting started

3.1 Material requirement

Moisture content

The requirement of moisture depends on different kinds of raw materials. The moisture content of sawdust is specified to 10%-18%. The materials should be mixed evenly.

Requested size

The maximum size of the materials cannot exceed the diameter of the pelletizing hole. For example, if the diameter of the hole is 6mm, the length of the saw dust cannot be more than 6mm. Please ensure the proper size of raw material according to the diameter of the hole.

Composition

This mill can process both single kind material and mixture with different materials. Pieces of stone and iron or other hard impurities cannot be mixed into the material; otherwise they will damage the die and roller.

Binder

Our mills are designed to pelletize without any additive binder. However we recommend using a binder, which can increase capacity and extend service life of die, roller and other wearing parts.

3.2 Inspection before operation

3.2.1 Check whether each fastening piece is tightened

Before operation, to avoid the bolts coming off and damaging the roller during running, ensure the bolts screwing on both sides of the roller are tightened enough. Check other parts overall to make sure there are no loosened or missed bolts.

3.2.2 Check whether the safety protection measure is completed

Before operation, check electric motor, electric cabinet and wires to prevent the possibility of electricity leakage. Make sure safety shield works well; make sure the floor is dry to avoid any accident.

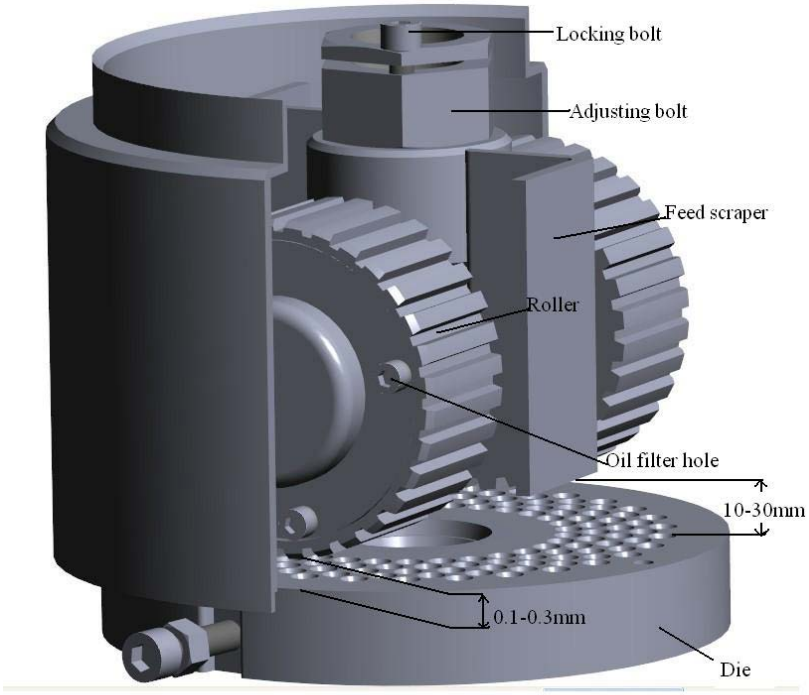
3.3 Adjust the clearance between die and rollers

3.3.1 Requirement

Clearance between die and roller has great influence on pellet quality. The best range of clearance remains 0.1mm - 0.3mm. The clearance adjustment depends on specific materials. When the clearance is over 0.3mm, the material builds up a thick layer on die, so the pellet capacity will be reduced greatly. When the clearance is less than 0.1mm, it will aggravate the abrasive wear between die and rollers, causing the service life shortened.

3.3.2 How to adjust the clearance of roller-driving pellet mill ZLSP-R

Adjust before operation: As shown in the following drawing, release the locking bolt before feeding material to machine. Screw the adjusting bolt clockwise till it cannot be screwed by hands, and screw the adjusting bolt anticlockwise 15°-30°. Then tighten the locking bolt at last.

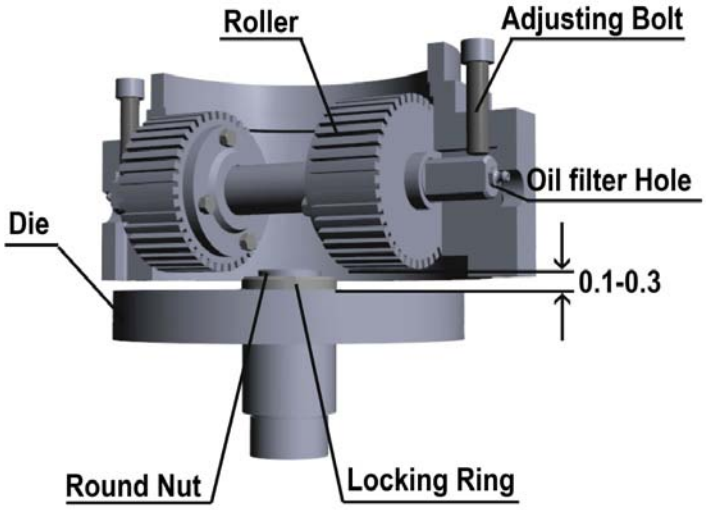


3.3.3 How to adjust clearance between feed scraper and die of pellet mill ZLSP-R

Adjust before operation: the clearance between feed scraper and flat die will greatly influences the output. If the clearance is too small, the material is hard to squeeze into the die holes, which would result in low output and more powdery products. If the space is too large, the motor will be overload or even burn out. The suitable distance between feed scraper and die is 10-30mm.

3.3.4 How to adjust the clearance of pellet mill ZLSP-D

As shown in the following drawing. Shortly after starting the mill, feed a small amount of material and turn the adjusting bolts on both sides of the roller evenly until the die drives the roller to run. Feed materials gradually and adjust bolts according to pellet quality and quantity.



3.4 Start the mill

3.4.1 Electric motor

Before the initial operation, check whether the rotating direction of the die is the same with the arrow label on the mill. If the direction is opposite, change the electric wire connection. Then switch on the circuit breaker, press the start button to start the mill.

3.4.2 Diesel engine (without electric starter)

1. Turn the speed control handle to the “start” position.
2. Inset the start crank into the hole of the start shaft. Press down pressure-reducing handle with left hand and roll the start crank with right hand till there is the normal sound by diesel engine running.
3. Roll the start handle fast. Release the pressure-reducing handle rapidly when the flywheel gets sufficient power. Then roll the start crank continually till the diesel engine starts up.
4. When the diesel engine starts to run, the start crank may drop away from the start hole automatically. So pull back the start handle in time to avoid accident.

3.4.3 Diesel engine (with electric starter)

1. Turn speed controller to the position of “ start”.
2. Turn the key to gear Ⅰ, and the starter is connected with the storage battery. Then turn the key to gear Ⅱ to start the engine.
3. Turn the key back to gear Ⅰ when the diesel engine is started.

3.4.4 Gasoline engine

1. Turn fuel valve to the position of ON.
2. Move the throttle level slightly to the left.
3. Turn choke lever to the position of CLOSE.
4. Turn the engine switch to the position of ON.
5. Pull the starter grip lightly till resistance is felt, then pull briskly. (Without electric starter). Switch on the engine. (With electric starter)
6. Turn the choke lever back to the position of OPEN.
7. Set the throttle at the desired position.

3.5 Preheating the mill

3.5.1 Before starting up each time, the mill needs to be preheated with the oily mixture repeatedly for 5 minutes or so. When the temperature reaches 80-100℃ (Fahrenheit), you can make pellets.

3.5.2 Oily mixture proportion: mix 7-12lbs raw material with 10% oil evenly.

3.5.3 Preheating procedure

1. Place a bucket under the discharge outlet so that the material can be collected and put back into the mill several times to preheat the mill.
2. Starting up.
3. Input suitable amount of oily mixture into the mill.
4. When there is vapor above the hopper, it means the temperature in pelletizing chamber is rising; when the discharged pellets are well formed with certain hardness, it means the die had been heated enough to produce pellets continuously.

3.6 The first grinding-in of new die

3.6.1 The die you have received has never been used. Therefore you need to grind in the mill. Please grind in before the first operation.

3.6.2 Oily mixture ingredients: Mix 20% fine sand, 65% biomass material (sawdust) and 15% waste engine oil evenly. Total weight can be 10% of the feed capacity.

3.6.3 Die grinding-in procedures

1. Place a bucket under the discharge outlet. Collected material can be put back into the pellet mill to preheat the mill.
2. Start up.
3. Input suitable amount of oily mixture into the mill.
4. Continue to pour oily mixture in and let it run through pelletizing holes.
5. Re-use the oily mixture in a recycling manner for 40-60 minutes.

3.7 Pelletizing

3.7.1 Feed materials and run the mill after preheating.

3.7.2 Material with low moisture content may results in producing soft or powdery pellets; Material with high moisture content may leads to producing rough pellets.

3.7.3 Loosen or tighten the adjusting bolts on the both sides if it cannot produce pellets. You may need to test several times on different materials or different moisture content to reach the best pellet quality. Please contact us if it still does not work well after adjustments.

3.8 Shut down the mill

Before stopping the mill, please let oily mixture run through the mill at least 3 times. This procedure is imperative to the following operations. It saves a lot of time for starting and avoids material blocking the pelletizing holes.

3.8.1 Electric Motor: Press “Stop” button.

3.8.2 Diesel Engine: Switch off the clutch of the tractor to separate state when the tractor is idly running and move speed controller to “Stop” position.（For the clutch model tractor）

3.8.3 Gasoline Engine:

1. Turn the throttle lever to the right side fully.
2. Shut down the engine.
3. Shut down the fuel valve.

3.8.4 PTO: Refer to the diesel engine.

4.0 FAQ and Solutions

Fault	Cause	Solution
No pellets are produced	1. New die has not been ground by oily mixture or ground insufficiently. 2. Material contains too much moisture. 3. Material is not organic in nature or does not contain proper amount of lignin.	1. Clean feedstock out of the pelletizing holes and grind the die with oily mixture. 2. Adjust material moisture content. 3. Add 3-5% additive binder into the material.
Motor halts suddenly	1. Voltage is low. 2. Pressure between roller and die is too high.	1. Start the mill again when voltage is stable. 2. Adjust the clearance between die and rollers.
Pellets are soft or powdery	1. Material is too dry. 2. Die is worn out.	1. Add water to material. 2. Change the die. Most of the die can be used both sides.
Rollers are worn out quickly.	1. Pellet mill runs for a long time without materials between rollers and the die. 2. Small hard impurities of iron, stone, sands and metal are mixed in materials.	1. Charge materials in time and make sure materials fill between the die and rollers. 2. Clean away impurities.

5.0 Quality assurance

5.1Warranty policy

We hereby warrant each new product to be free from defects in material and workmanship for a period of 12 months from the date of shipment. We will replace defective parts or components without charge, transportation charges shall be the responsibility of the purchaser.

We reserve the rights of requiring the purchaser to return the defective products or parts to our factory for inspection.

5.2 Exceptions

1. The mill is not purchased from us or an authorized franchisee of our company.
2. Any part of the product has been altered, modified or changed without our written authorization.
3. The mill has not been installed, operated or served in accordance with the instruction manual.
4. Wearing parts, such as electric parts, rollers, dies, bearings, grease seals, belts, are not covered by warranty.
5. Any loss or damage directly or indirectly caused by improper operations will be borne by purchaser.

Notes:

As technology advances, our products are updated regularly. We are not liable for informing purchaser of product changes in structure and performance.

6.0 Main wearing part

6.1 Main wearing part list of model ZLSP-D

Parts	Model						Qty	Installation site
	120	150	200	230	260	300		
Bearing	6204RZ	6204RZ	6205RZ	6206RZ	6306RZ		4pcs	Roller
Bearing	6206	6206	6208	6209	6312	6312	1pc	Main shaft
Bearing	30207	30207	30309	32309	30312	32313	1pc	Main shaft
Bearing	6203	6204	6206	6307	6305	6207	1pc	Gear shaft
Bearing	30205	30205	30207	31309	30309	31309	1pc	Gear shaft
Bearing					30209	30209	1pc	Gear shaft
Bearing						6207RZ	6pcs	Roller
Grease seal	28*50*10	28*50*10	42*70*11	47*84*12	58*90*12	55*90*12	1pc	Gear shaft
Grease seal	**Felt retainer**						2pcs	Roller
Grease seal	**Felt retainer**						1pc	Main shaft
Washer	80	80	105	105	150	150	1pc	Coupling
Roller							1set	Upper box body
Mold							1pc	Upper box body

6.2 Main wearing part list of model ZLSP-R

Parts	Model			Qty	Installation Site
	200	300	400		
Bearing	32310	33216	33218	1pc	Main shaft
Bearing	6310	6216	6218	1pc	Main shaft
Bearing	NJ207E	30211	30213	4pcs	Roller
Grease seal	42*62*8	60*80*8	70*90*10	1pc	Die
Grease seal	45*65*8	75*95*10	85*105*10	1pc	Dust cover for the main shaft
Sealing	45*3.55 O-shaped	O-shaped	O-shaped	1pc	Discharge plate
Dustproof	Felt retainer	60*3.55 O-shaped	70*3.55 O-shaped	2pcs	Roller
Dustproof	Felt retainer	Felt retainer	Felt retainer	1pc	Main shaft
Roller				1set	Upper box body
Die				1pc	Upper box body